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Weber, F.C.

Dr. Frederick C. Weber's solution of the centuries' old problem: "Is there a creative power in disintegration in the universe".

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Told in Simple Language
Which All Can Understand

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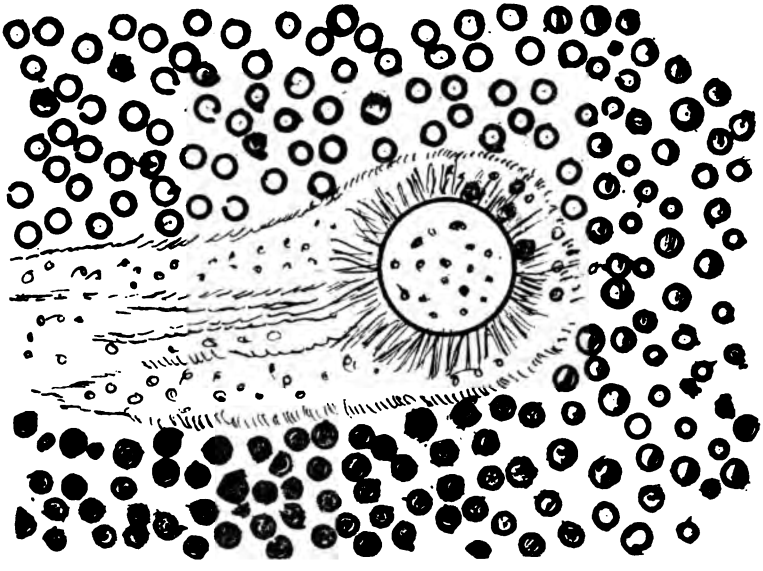

Sketch showing how an eleventh magnitude fixed star crashed into, and through a dark star field, and so formed the Nova Aquillae of 1918. Going to its disintegration by its impacts with units of the field while crashing through.

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Sincerely
Dr. Frederick C. Weber.

INTRODUCTION.

All advances in natural science are the result of the most careful scrutiny of all that, which has gone before in every branch of human knowledge and has withstood the acid test of adverse analysis. In the solution of this century's old problem, namely: "Is there a creative power in disintegration in the universe?" The factors which must necessarily enter into the answer, must be proven facts, which in any way have an intrinsic bearing upon the problem awaiting solution. This includes all of the basic laws of chemistry and of physics, as well as those of astronomy; each proceeding basic natural law bearing a strict correlation to the following. In no other way can a solution of this problem even be attempted. When solved it will conslusively prove the eternity of the ponderable matter of infinite space, in its eternally closed circle of revolution; as it is displayed to our senses, perceived by our own eyes, ears, and intellectual faculties, here on earth and in the starry heavens above.

It is not a conceded fact that the past ages of the earth's origin and development have been a matter of revelation, as alleged to some one or more men from an alleged sentient supreme power. All the revelations of the by-gone ages can be laid away as the baby prattle of childish minds. Only a careful conscientious study, and a thorough understanding of the natural laws governing the eternal matter in infinite space, will conclusively show the facts regarding the starry nebulous universe's endless existence, with their known components of suns, planets, asteroids, comets, and star debris. We know from the facts proven by astronomy, that there are myriads of suns like our own, estimated by competent observers to number five hundred millions (500,000,000) or more, which constitute the starry nebulous universe, of which our solar system is a unit, and which are constructed on lines similar to our own, being all alike composed of the same kind of elemental matter. Astronomy also proves that there are tens of thousands of vast starry nebular universes in infinite space. The light from which reaches us, and all are constructed on the same general plan as ours, being composed of the same elemental ponderable matter throughout, the light emanating from each separate universe being sent through the ether filling infinite space. The telescope and the spectroscope prove this conclusively. We stand on firm proven ground, not on suppositions, nor on any alleged revelations.

The above known facts prove without any doubt, that all elemental ponderable matter, except the ether, is grouped in starry nebular universes as units in infinite space; all governed alike by the same natural laws, and they are all composed of the same elemental matter. It is the knowledge, proof, and orderly correlation of these basic governing natural laws that will solve this intricate problem with finality.

The author has endeavored to solve this problem by systematically placing in regular sequence the basic natural laws controlling in this problem, and he has comprehended just where the chemico-physical laws of his own formulating furnish what seems to be the last link in the chain of laws applicable in the solution of this problem. And he has fitted in these laws as the closing link with the other laws which apply, thereby having found the definite solution of the problem, the details of which he has set forth in this little booklet in his own way.

THE AUTHOR.

Dr. Weber's Solution of the Problem:

"Is there a Creative Power in Disintegration in the Universe".

Having established a correlation of the natural laws which will solve the problem at hand, namely: "Is there a creative power in disintegration in the universe?", we can draw some definite conclusions from this established correlation which can be accepted as being authentic. We can accept as proven fact, therefore, that all matter of space is eternal, that is, it always was, is, and will be existent. We can logically now attempt to obtain a meaning and conception of the idea of infinite space, as far as this is possible to our reasoning faculties.

Let us take a simple round ball such as is used in boy's play. Let us stick this ball, which is a sphere, full of brass pins and stick them in, in such a way that every pin put in has another one directly opposite, which, of course, will make the two opposite pins project exactly in opposite directions. With a ball filled just as full of such opposing pins as is possible, opposing lines can, of course, be projected in diametrically opposite directions. Now let us accept as fact, that each one of these opposing lines can be projected into space ahead forever. Astronomy says that they can be projected in this way and forever. This is definitely and correctly expressed by saying that space is infinite. This surely brings to our mind a very good conception of the idea of infinite space. Space being infinite, it would still exist as the definite space entity if all of the matter in space were in reality, utterly annihilated, that is, rendered absolutely non-existent. But the exact science of chemistry, conclusively puts a finality on that supposition, by saying "NO!" Matter undergoes change only. Annihilation never! Here we are on firm proven ground. Axiomatic ground, in fact.

The matter of what space amounts to; the vastness of its extent is simply far and away beyond the comprehension of human minds. Taking our nebular universe as an example, which is a typical one in space, it is a vast flattened disk-shaped aggregation of solar systems whirling on a central axis, and is so vast in extent, that it takes over 60,000 light years for light to cross it on the flat at its hub and over 300,000 light years for light to crosss it at its center from edge to edge. Light is definitely known to have a velocity of about 186,000 miles per second of time, in passing through space. If we make an attempt to figure the number of miles the nebular universe is across on either way; across the hub, or from circumference to circumference, we get a row of figures so long that it means incomprehension. We can by comparison only try for some way whereby we can get some idea of distances in space—infinite space.

Commencing with a starry nebular universe, its distance across is over three hundred thousand light years in its greatest diameter. The distance away of Sirius, the dog star, the second nearest fixed star to earth, is 8.4 light years away. This figures out in miles to be so vast that we can scarcely put the row of figures on a line of letter paper. And the nearest star to the earth is in the constellation of the Centaur, Alpha Centauri, twenty-three trillion miles away, (23,000,000,000,000) and is the very nearest one, over four light years away, with nothing between our solar system and this star but the ether of infinite space. Sirius, the dog star, is forty-seven trillion (47,000,000,000,000) miles away. To get even a faint idea of what these vast distances mean, we can compare the velocity of light, or try to, with its speed of one hundred and eighty-six thousand (186,000) miles per second with the speed of an express train. The sun is ninety-three and one-half million (93,500,000) miles from earth. If we will imagine a family of human beings going to the sun at express train speed, and going without any stops on the way, the tenth generation will arrive at its destination. And the push of gravity exerted by, or through, the ether of interstellar space, notwithstanding these vast distances, maintains the aggregation of matter in space, as starry nebular universes with their various components eternally in motion and changing existence.

Gravity is the first governing law of the eternal matter of infinite space. If we start to gain a comprehension of infinite space, by starting our effort, with trying to gain a comprehensive knowledge of the distance away of the next nearest nebular universe to our own, our minds are simply hopelessly lost, because we have nothing to compare with. The nearest one is thought to be the nebular universe in the constellation of Andromeda which is known to be much larger than our own universe. This nebular universe is plainly visible to the naked eye on a clear night and to our sight appears to have an area of several square inches. But its diameter is over four hundred thousand (400,000) light years across in extent, and figures out to be over two quintillion and five hundred quadrillion (2,500,000,000,000,000,000) miles in diameter. And this inconceivably vast extent in area, is reduced by perspective, at our distance away to an apparent area of a few square inches.

Let us try for a comparison of the perspective by taking the areas of the sun and the moon, as they appear to our eyes, apparently the same size because of their different distances away. The sun has a diameter of eight hundred and eighty-six thousand (886,000) miles. The moon's diameter is about 400 times smaller. But the sun is 400 times farther away. And perspective makes their areas, which are so vastly different, appear to our eyes, as being almost alike in size. Now let us imagine, or try to, how far away in space is this next nearest neighbor of the nebular universes with its diameter of over two and a half quintillion miles, which by the perspective is reduced to an apparent area of a few square inches. Our imagination uses the pithy slang phrase of "Search me," and quits. And then, light comes to earth from nebular universes so far away in space, that only a photograpric plate, after a long exposure will show their presence, proving their distance to be millions of light years away. And gravity, exerted through the ether of space, is the first controlling law which rules them all as a combined entity without any exceptions whatever. Nebular universes are, because of gravity, simple units in infinite space. The second in importance of the governing laws, are a series of laws, which are the laws governing the combination of the elemental atoms into chemical molecules. And of these laws, the one which has proven that energy is as integral a component of every chemical molecule formed, as are the elemental atoms composing the molecule, is the law which proves that the elemental atoms can eternally undergo combination, disintegration, and again combine into new molecules under whatever combining conditions obtain at the time.

The next in importance, are the semi-chemical laws which as chemico-physical laws prove that energy, force, power, or whatever term we use to express the idea of work being performed, is an exact permanent measurable entity. The law of mechanical correlation of force, has the same integral effect precisely in chemical combinations forming molecules, as it has in mechanics or physics.

These basic natural laws, by their correlation, conclusively prove that there is a creative power in disintegration in the universe. It is not a matter of alleged revelations which asserts utter annihilation of the earth, nor of a great name giving an ipse dixit claiming unquestioning recognition for its assertions as being proven fact. It is the actual correlating of the natural laws themselves, which correctly solve this problem. The author has in his own way made the effort to do this.

The evolution of a solar system such as ours, which is a typical one in space, from a gaseous nebular component of a nebular universe, is a part of a closed circle of revolution as it ceaselessly progresses throughout eternity. All of the changes throughout its complete closed circle course are the result of definite immutable natural laws. It can be accepted as axiomatic that all of the phenomena of nature, are the result of natural laws, which automatically govern and control matter in space, eternally in regular sequence. These natural laws are the Deity of all the matter in infinite space. These natural laws govern the simple formation of a single chemical molecule, as absolutely as they govern the nebular universes which have such enormous extent or size, that it requires hundreds of thousands of years for light to travel across them. These are the laws, which, when understood and formulated, prove that the evolution of a world is not an arc ending abruptly at its etremities, but is a part of a complete circle which is closed. These laws govern all of the innumerable nebular universes in space alike, of which our own is only an insignificant unit member. Of this nebular universe of ours, our own solar system lies somewhere near its centre; and the milky way, as we see it in the sky, is the periphery of our nebular universe. Comprised within our nebular universe are hundreds of millions of solar systems, having one or more central suns which are in various stages of their course of evolution, all the way from greenish intra-universe gaseous nebula in an initial stage to dark star fields as they are known to exist in what are known as the coal sacks in and near the milky way. The coal sacks themselves really are dark star fields, appearing dark to us, they being dark stars showing dark against a luminous background of light giving suns. That there is a definite sum of ponderable atoms, as the definite component of each nebular universe, is proven by the spectroscope and the telescope. The fact that the sum of these is so vast as to be wholly beyond the mind's comprehension, does not prevent the mind from grasping the fact that there are a fixed number. But the ponderable atoms composing the nebular universes are only one part of the universe's components. There is just as definite and fixed an amount or sum of energy which is as much an integral component of the nebular universes as are the elemental atoms of each universe. This energy is what, as the natural laws of the universe, automatically governs the universe. That is axiomatic unquestionably. It is the understanding of these laws which will solve the riddle of the universe's eternal revolutions.

That which we must always accept as fact is, that all of the natural laws of the universe are in strict harmony. Never under any circumstances whatever, are any of the laws of the universe ever set aside, nor are they ever suspended. Neither are they ever under any circumstances inoperative. When a natural law is called into action it always acts. And it always acts in strict harmony with all other natural laws, and infallibly so.

Here on this axiomatic basis, rests the fact that every known science is an integral component of the sun of human knowledge, comprised within the entire range of the natural laws of the universe, so far as the human mind has discovered them. It is on this axiomatic basis that all natural laws act in perfect harmony, based on the chemist's studies and knowledge of the ultimate atom or atoms and their chemical combinations as chemical molecules. Under the conditions which exist here on our earth, the chemist can state correctly that the chemical combinations of the universe are identical under like conditions, and that they are so throughout infinite space. For infinite matter in infinite space it is one kind of atoms, and one basic energy. No multiplicity of basic ultimate atom or atoms, nor no multiplicity of energy anywhere in infinite space. Absolute harmony is the law of all the infinite universe, without which harmony, chaos would reign. That is fact beyond question.

Here is where the chemist can state correctly that there is a creative power in disintegration in the universe; not only in our nebular universe but in all of them throughout infinite space. And that gravity is exerted as a unit, governing them all alike, irrespective of their distance apart, no matter how great the distance.

Disintegration in the universe is most conspicuously shown when some great sun having a diameter greater than that of our sun like the one of last year, 1918, the Nova Aquillae, encounters a dark star field, and the impact acts to smash and destroy the sun, wholly reducing it to star debris or it escapes in a much damaged state.

Let us reason: The Nova Aquillae was a sun, a central luminary like our sun, having attendant planets. And also like our solar system had its planets, asteroids, comets and star debris throughout its extent. This Nova Aquillae was, and is, one of the components of our nebular universe just like our own solar system, and just like our solar system is subject to its laws, which, when it encountered the dark star field was badly hurt.

From the above, we know that the sum of the atoms and the sum of the energy of the universe as contained in its units, are of a fixed definite sum, (for both, for the universe, throughout its extent). Knowing this, what more clear than that when this Nova Aquillae sun, the centre of a solar system, encountered the dark star field it was disintegrated as to its component parts and of its energy as forming a system. But it was only disintegrated as to its condition as a solar system, reducing its star aggregations to star debris, which debris retained all of its own integrally component energy intact. Nothing was destroyed beyond being disintegrated and reduced to debris.

Our universe is full of star debris of which we have definite knowledge through the twenty million meteors which daily strike our atmosphere, and have so struck it for ages reckoned by millions of years. And it is this star debris composed of the same elemental atoms as those found on our earth, and those striking and having struck our atmosphere, whivh proves the sameness of the elemental atoms throughout our solar system and our nebular universe. And further and positively the spectroscope proves them alike throughout infinite space. Here we stand on firm proven ground. It is not a silly matter of alleged revelation of some dead man who died ages ago. What proportion of the matter of our universe consists of star debris, dark star fields, composed of dead and dying suns, solar systems, and solar systems in process of evolution; gaseous nebula, and whatever other components of our, and all the other nebular universes there may be. All of them are perpetually undergoing the closed circle revolution changes, from gaseous nebula, through all the component parts forming a nebular universe back to a gaseous nebula component of our universe from which the changes started. All of these changes are determined by the natural laws which automatically govern ponderable matter and energy in infinite space. These laws are eternally and automatically operative. Of the basic natural laws, the laws of chemistry are those which are most in evidence in all of the changes from gaseous nebula back to gaseous nebula. Of these laws the laws of molecular formation are governing.

Every chemical molecule formed requires a definite amount or sum of energy as latent energy of molecular stability for its formation, along with the elemental atoms composing the given molecule.

The energy required for the formation of a chemical molecule, as latent energy, stored up, is as integral a component of the molecule, and just as definitely a component of the molecule, as are the atoms of the molecule.

When a chemical molecule is broken up its component energy is liberated along with its atoms in exactly the same amount as that which was required for its formation.

These three chemical laws of my formulating, based on known facts, prove positively that there is a creative power in disintegration in the universe.

These chemical laws are not, however, the only ones concerned in this matter of a creative power in disintegration in the universe.

The next in importance are the laws governing the heat changes due to a change of state.

For instance, the heat rendered latent by changing ice to water is given off again in the same amount as when the water is frozen to ice.

These laws are general in their action on changes of state.

And they apply just as generally to changes of state from gaseous to liquid, and back again.

Then by compressing a gas, heat is liberated, which, when the gas with the pressure released is again taken up in precisely the same amount as was liberated when expanding to its former volume. Here in these three sets of chemic.-physical laws we have positive proof that energy is just as definite and distinct a component of all the nebular universes as are their elemental component atoms. For there is no multiplicity of natural laws, any more than there is a multiplicity of matter.

The first set of these three laws were formulated by myself, while studying the exothermic chemical reactions of reducing metallic oxides to metals with aluminum.

While studying these heat changes, I found to my intense surprise, that an aggregation of the atoms of a metal (one, aluminum, for instance) to exist in the metallic form, as we know it, requires a definite fixed amount of heat energy as latent heat of molecular stability, just as does a molecule composed of different elemental atoms or it can't exist or be in the familiar form as a metal as we know it. Here is another case of proof that energy is a definite component of the universe.

All of the above are proven facts. They are axiomatic.

These natural laws act just as infallibly in every case from the trifling chemical changes in a test tube in a laboratory, to the vast changes in the star giant Rigel. For this we have the evidence of the spectroscope and the telescope.

In the above we have again, firm proven ground or demonstrable facts to stand on.

But when it comes to the matter of details, of why the above is fact, we are still in the unproven field of theory.

Chemical molecules are known to exist as a result of the known valency of the ultimate elemental atoms. But why is there a valency of the atoms? Here we can, as yet, but theorize.

Up to now, no theory set forth by any chemist or physicist, is without some flaw. Infinite space is filled full of elemental atoms and energy. Atoms are capable of proof as to their existence, for ponderable matter itself proves that. But as to the allotropic forms of energy we still theorize and grope about.

But energy! A Known Entity! What is it? Why is it? That it is a definite entity we know. But What?

Let us reason from known facts as a correct basis, and see where we land. In a void nothing can occur, for nothing exists there. The only voids in nature are the interspaces between the spheres of the ether.

In a void nothing exists.

But energy is the known controlling force governing the combinations of the entire ponderable matter of all of the nebular universes of infinite space.

Here we can logically reach but the one conclusion, that there is no such thing as a void beyond the voids in the ether in the universe, for the initial force of light emanating from a luminous star carries it throughout infinite space. If space were a void, light could not travel across it. That is self-evident. We can reach but the one conclusion here that there can be such a thing as a vacuum, but no void. A vacuum is a space in which nothing is present but the ether of infinite space. Infinite space, or in a limited sense, interstellar space, containing the ponderable geometrical magnitudes as ether which transmit the energy from its local source to its distant objective, is not a void. If it were a true void no energy could be transmitted through it. That's sef-evident. The only voids in infinite space are the interspaces in the ether between the spheres composing the ether. This explains in a fairly clear way of why the metallic conductor carrying electric current is capable of transmitting such a large wattage. The oscillations of the ether spheres as electric current flow, oscillates the spheres out of normal and back again, against a void both ways; each one of the spheres, oscillating against its own adjacent voids, and are confined in their movements by the atoms of the metal. In a vacuum there must still be ponderable matter as atoms. And reasoning intelligently interstellar space is a vacuum, and not a void. We can come to no other conclusion. Light and heat, or allotropic wave oscillations going through space clearly and logically proves this.

From the above we are limited to but one line of reasoning; that the ponderable matter in infinite space must be that its elemental atoms are definite geometrical magnitudes or physical solids, having length, breadth and thickness.

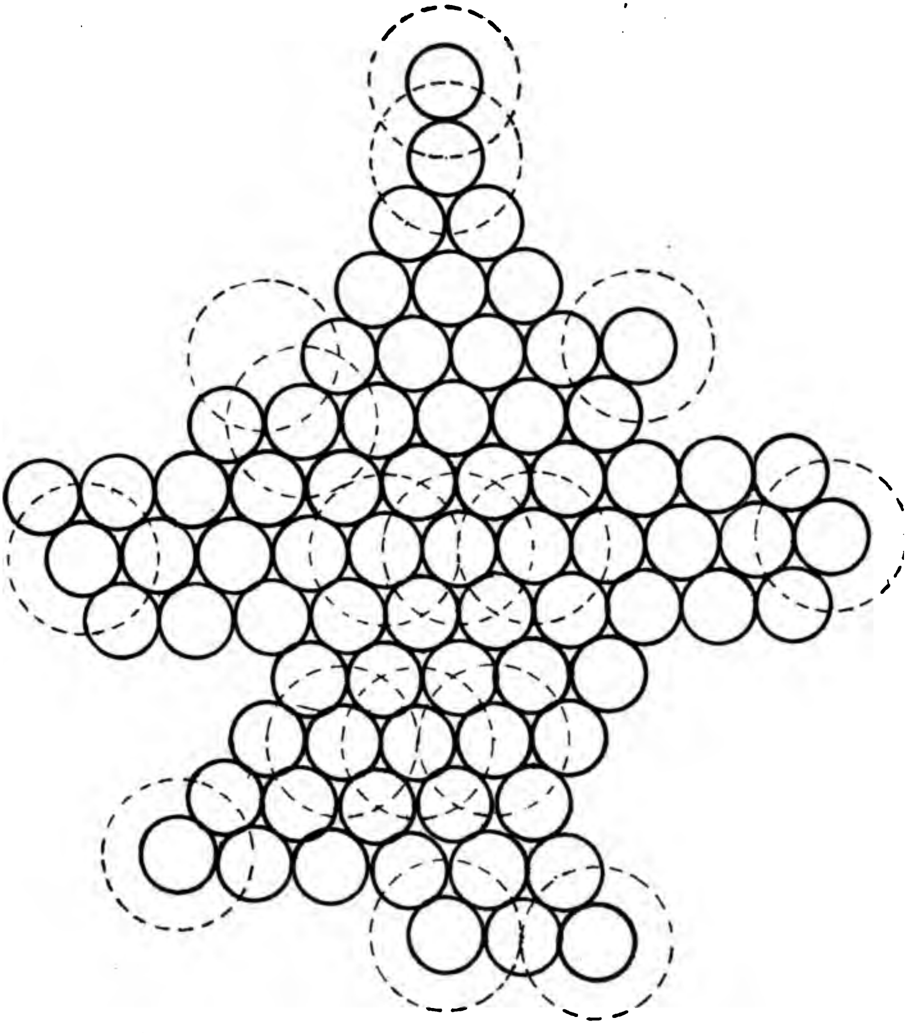


FIG. I. Showing a number of circles of the same size on a plane surface. It will be seen by examining this sketch that any one of the circles can be made a central one, with six surrounding ones, or

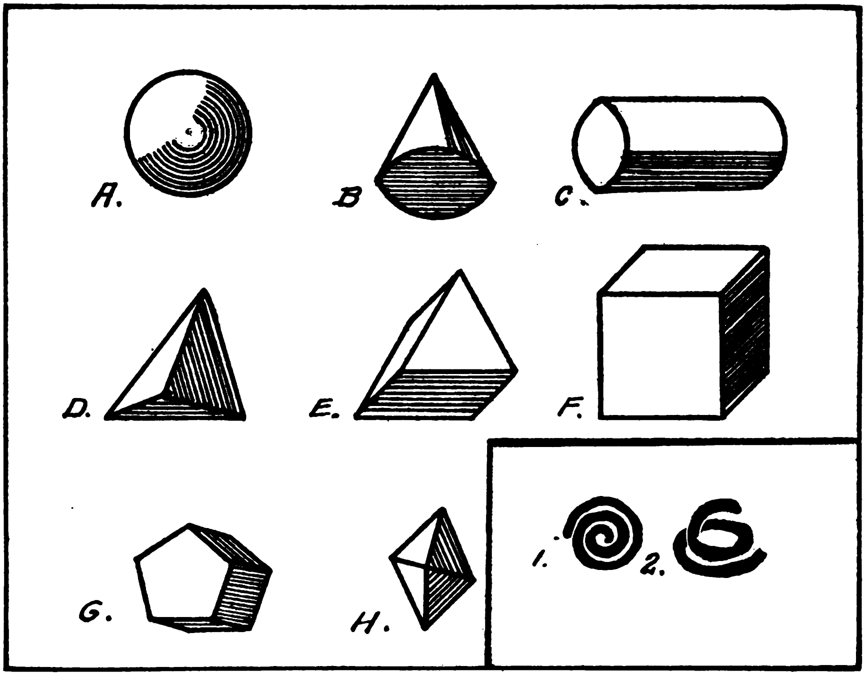
this central one can be made one of the surrounding six of any other circles which can be inscribed on these circles, or their extensions by adding more. Taking spheres instead of circles, and of equal size, irrespective of how large or small, they can be put into horizontal superposed layers with each next succeeding upper layer so placed that its spheres will lie accurately in the hollow spaces between the next lower layer. When three layers are superposed in horizontal planes, all of the spheres are in tangent aggregations of thirteen spheres, any one of which thirteen spheres can be a central one of another aggregation, or it can be any one of the tangent twelve of the central one.

Infinite space is filled with the other, and the other is composed of elemental atoms of geometrical magnitudes as physical solids, which when considered as spheres, furnishes a very good explanation of their being capable of performing what we know the ethers' functions to be.

No matter how small, they are positive geometrical magnitudes. And that some one or more, and possibly all of these atoms, are responsible for the allotropic manifestations of energy. For we know that heat, light, electricity, magnetism, sound, and all of the different rays are allotropic forms of the same one elemental force, energy, for we can transform them at will.

Accepting this as a definite reasonable basis from which to attempt to find some definite solution of the problem we are up against, in trying to find, what can be the ultimate forms of the elemental atoms. We can reason from the known basis, that there is a known valency of the elemental atoms and a positive known allotropism of energy.

These can be reasonably explained as follows. There are eight groups of the elemental atoms as defined by the well known periodic law. And by a curious coincidence, there are eight definite basic elemental geometrical magnitudes, which have eight definite facets or bounding surfaces.



A shows a sketch of a sphere with its one and only surface. When comparing this solid it appears at a glance that it is not shaped to admit of any one of the other solids making a tight joint.

B shows a cone with its two faces. It appears from its form to permit of only one close fitting joint, on its base.

C shows the rod with its two plane surface ends. This solid will furnish two surfaces for other atoms to join, and make a chemical union.

D shows the tetrahedron with its four plane surfaces for making tight joints with other atoms.

E shows the three-sided tablet with its five plane surfaces to give quintivalency to atoms so shaped.

F shows the cube with its six plane surfaces.

G shows the five-sided tablet with its seven-plane surfaces.

H showst the octahedron with its eight plane surfaces.

In these geometrical magnitudes we have mathematical proof that all atomic valency is based upon the shape of the ultimate atoms composing all of the ponderable matter of infinite space.

Fig. 2. 1 & 2 Shows the Radium and Helium atoms. The only exception! The radium atoms exception is apparent only. We know that in Rigel Helium is present in large amount. But Rigel has a temperature of twelve thousand degrees Centrigrade. A temperature sufficiently high to uncoil the radium atom.

First, we have the sphere, with its one and only surface. Second, we have the cone, wtih its two surfaces. Third, the rod, with its three surfaces. Fourth, the tetrahedron, with its four surfaces. Fifth, the three-sided tablet, with its five surfaces. Sixth, the cube, with its six bounding surfaces. Seventh, the five-sided tablet, with its seven surfaces. Eighth and last, the octahedron, with its eight triangular surfaces.

All known crystalline mineral forms can be constructed from these eight basic geometrical forms. Now what more reasonable, than to assume that here we have a correct basis, founded definitely on the exact science of geometry? What more reasonable to assume, than that the various modifications of these eight elementary forms, are the correct ultimate geometrical forms of the elemental atoms, and that their several modifications, are the basic reason of why there is a valency to definite groups of the elemental atoms? And here also; comes in a reasonable explanation, of why there is the ether of interstellar and intermolecular space, through which heat and light are transmitted between the nebular universes of infinite space.

If we assume, by logically following the above line of reasoning, that the elemental ether is composed of spheres, we are within the bounds of reason. We know that aggregations of thirteen spheres tangent to one another, can be made to fill all of any given space. In any large aggregation, any one of the thirteen can be a central sphere, or any one of aggregations of thirteen can become a surrounding one.

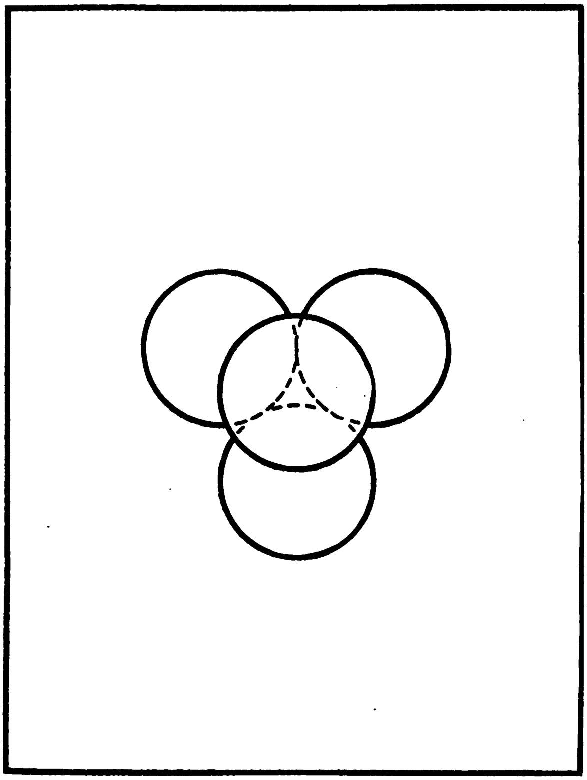


FIG. 3. Showing four circles of equal size, and how one can be placed exactly centering over the interspace between the lower three, and exactly centering over one placed below.

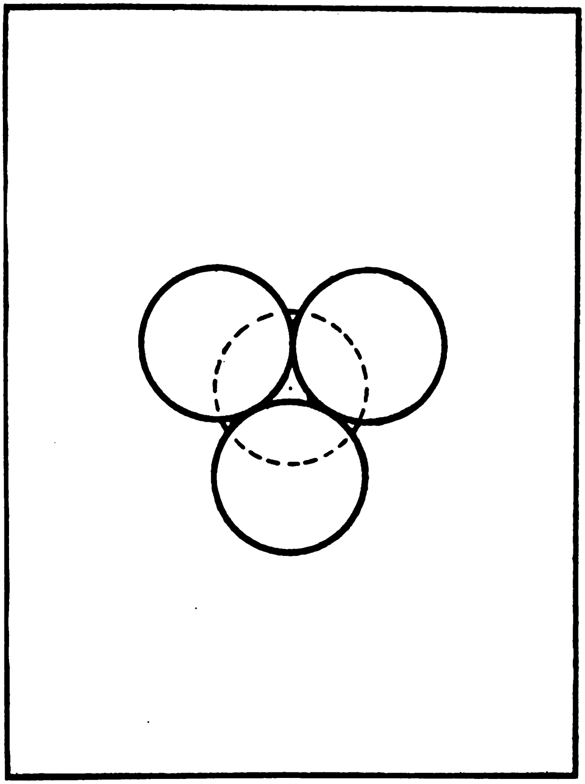


Fig. 4. Showing four circles of equal size, and how one can be placed exactly centering under the interspace between the upper three and exactly centering exactly under one placed above.

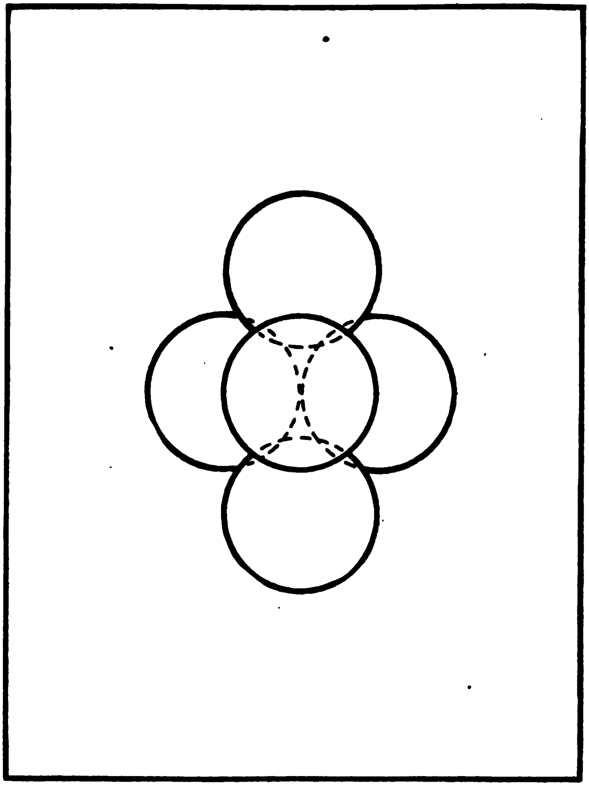


FIG. 5. Showing arrangement of the spheres, but drawn as cirles in three superposed layers and in three parallel rows, with the spheres lying in the interspaces of the next lower layer.

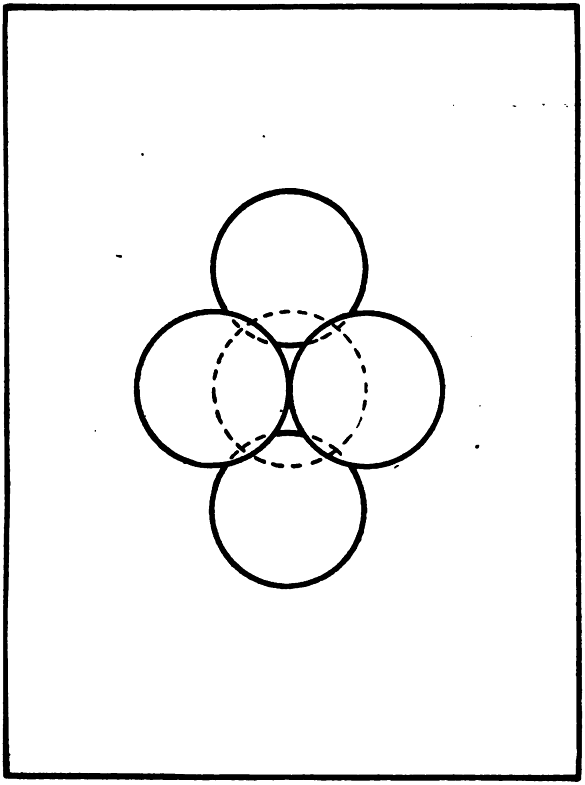


FIG. 6. Showing arrangement of the spheres—but drawn as circles—in three superposed layers, and three parallel rows, shown as being in the interspaces of the next layers, and showing how the spheres centre exactly over in every odd numbered layer, as they are superposed. And this obtains throughout infinite space.

By starting an oscillation from the different members of either side of six of the twelve surrounding spheres, the oscillation can be transmitted in curves or waves of varying character, forward and away from the sources of impact, in as many ways as there are allotropic basic forms of energy.

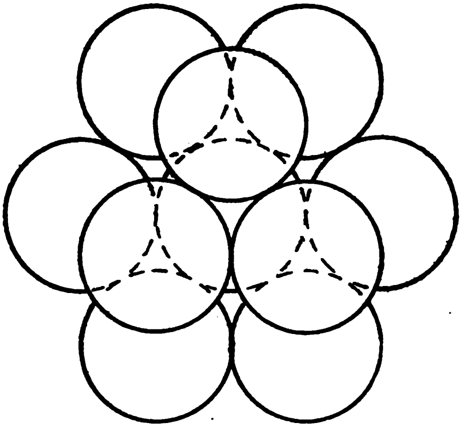


FIG. 7. Showing how an aggregation of thirteen equally sized spheres with its central layer of seven, can have the three spheres placed in the central layers six interspaces, so oscillated, that they can be swung around in a complete circle over, and through the six interspaces, and back into their original position. The three spheres, each of which is tangent to six others both vertically and horizontally, can obviously be swung around with one or more stops, or clear around without any stop at all; back into normal.

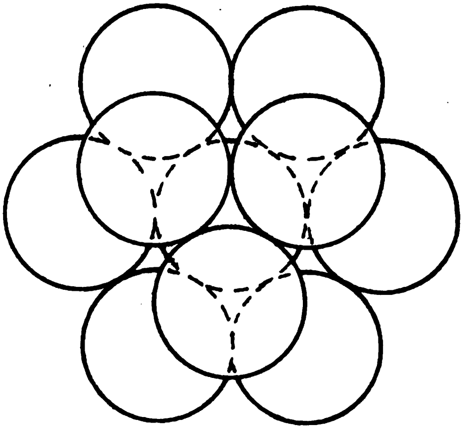


FIG. 8. Showing the same aggregation of spheres as the preceding, and showing the three spheres as being swung half way

around. We can reasonably assume that the well known jerky action of the electric current flow back to its source of origin is due to the oscillating spheres making a stop when half way around, in their twist through a complete circle.

The firm, solid mathematical ground upon which we can build here is the demonstrable fact that there are six primary, allotropic, forms of energy, heat, light, sound, electricity, magnetism and the X rays. And that spheres of equal volume when in massed form are always massed in aggregations of thirteen tangent spheres, of which with three on opposite sides from a central layer, can be moved around in a circle with six stops during a complete movement around the circle. We know from the evidence impressed upn our senses, that there are definite geometrical magnitudes as ponderable matter which are the ultimate components of the ether of infinite space. Our problem is to ascertain what is the form of these geometrical magnitudes so that they will furnish a satisfactory explanation of the why of the primary forms of energy impressing our sense as they do. To me the sphere furnishes a satisfactory explanation. At least until a more satisfactory one is demonstrated to me! Assuming that the sphere is the elemental ether atom, and assuming that the ether is displaced in space by all of the aggregations of ponderable atoms as units in the ether of space, directly according to the amount of the aggregation. We can ask, how does the given displacement affect the situation of the others through a given displacement? The answer is furnished by the varying push of the ether, pushing from space, as shown by the varying weight of a given mass of ponderable matter of the same volume, and density, as it will be on aggregations of matter in space of varying size and density. Competent astronomers have figured that a masss of matter weighing one pound on earth, will weigh 26½ lbs. on the sun, 2¾ lbs. on Jupiter, 15 oz. on Venus, 4 oz. on Mars, 2¼ ozs. on the Moon, and 8/11 ozs. on the asteroid Ceres. These known and demonstrable facts conclusively prove Gravity to be a pushing and not a pulling force. Gravity is a "vis a torge." It is not a "vis a frontis."

That electric energy is an oscillating wave force is known, but through what medium, is as yet but theory.

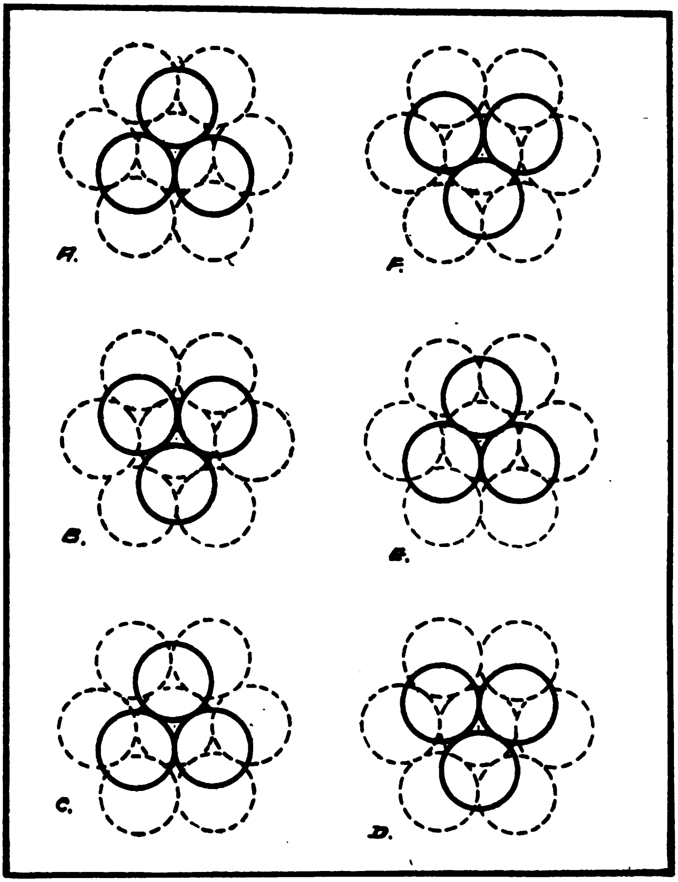


FIG. 9. Sketch showing six groups of circles in two superposed layers, to show how the three central ones of the upper layer, can be oscillated completely around the circle, and making a stop in each of the six interspaces of the central layer of seven spheres. This capacity of the revolving movements to stop, and then of progressing after a stop, from each interspace, furnishes a reasonable explanation of why the magnetic lines flow is gentle compared with the electric

current flow. Following this line of reasoning, we can assume that the heat energy is the revolving movement of the ether spheres with two stops. That there is one stop for the electric current flow, three stops for the sound waves, four for the light beams, five for the X and similar rays, and six for the magnetic lines flow. Geometry proves that spheres can be moved about when tangent just as is shown by the above simple cuts, in the attempt to prove, and know just why heat, light, electricity, magnetism, and sound are allotropic forms of energy as they exist to our understanding. Here we have firm mathematical ground to stand on, in an attempt to know demonstrable facts. It is not a matter of ignorant belief, or silly revelations, nor dogma based on such stuff as dreams are made of. If we accept as fact, that heat, light, electricity, sound, and magnetism, are the result of oscillations of the ether, and their being so and based on the stops in the circular movement of the three spheres in all aggregations of thirteen spheres, we can reasonably assume that the X rays are the result of varying combinations of stops, and then forward movement in the circular swing.

That a ponderable medium is, and the medium must be, is also known. But what its form is, is theory. We can, by reasoning from actually known facts only, arrive at a reasonable conclusion. We know that certain chemical molecules when in chemical union as molecular aggregations, like a film of mica, will be opaque to electric current. We also know that metals as aggregations of molecules, will permit of electric current flow, but in varying degrees only. As an illustration, with pure copper free of dissolved copper oxide at 100, aluminum permits but 63 and swedish iron but 16. There is a reason for this. But what? Electric energy flows in a closed circle always. Returning to the point where it originates, from this known fact is is reasonable to asssume that the elemental ether as spheres, are forced out of their normal places and back again in a closed circle. When the current flow is through a metallic conductor like a wire, the ether spheres are in the interspaces of the molecules, but not between the atoms; the different shaped atoms of the different metals, allowing a greater or lesser number of the spheres in the mass of the metal between the molecules and this varying number, and arrangement to a given volume, determining the amount of current flow. We know that by stringing a disconnected wire parallel to another wire through which current is flowing, the disconnected wire becomes inductively charged with current. These known facts show that the ether spheres are so confined in the intermolecular spaces of the wire's molecules that there is a leakage from the wire into the air, and then from the air into the second wire, where the electric energy is of greater effective transmission than in the open air because of the ether sphere's aggregations hemmed in condition, just as in the primary wire. This shows, as an illustration, that the form of the atom of sulphur being opaque to current flow is such, that the elemental ether spheres cannot be in that atom's molecules as aggregations of thirteen, which is essential for the electric current flow, just as is the case with mica. The elemental ether spheres fill all spaces throughout infinity, and necessarily while the earth revolves around the sun in its orbit, the earth does twice a year come to a point where the aggregations of thirteen are so placed on the flat, that a line drawn from the sun to earth will pass through the central spheres direct and without going through the six opposites. This accounts for the known fact that at times, eruptions on the sun are recorded on astronomical instruments, almost simultaneously with their occurrence, and minutes before heat and light waves arrive, due to the eruption.

Assuming that the interstellar space matter which we call the ether is actually spheres, we need but to look upon them as of such minute size as will permit of the transmission of light and heat by oscillation waves through them. The Sodium atom is so small an entity that one two hundred millionth (1/200,000,000) of a grain of metallic sodium introduced into a spectroscopic flame, will still produce its characteristic yellow line with perfect clearness. Reasoning by analogy, the elemental ether sphere is also an extremely small entity, which may be even smaller than the Sodium Atom, and yet be of perfect geometrical magnitude. The element of the time which passes for these waves to travel from point to point in space is readily explained by the fact that the spheres are merely tangent and not one solid mass. But time would no doubt also elapse, were there a solid. There is a question in the matter of the transmission of light and heat, from point to point in the universe, of whether they are simultaneous or not, by wave oscillation through the ether; because the waves are not in the same manner of forward transmission, but we can reasonably assume that the waves which come are transformed when they enter a planet's or some other sun's atmosphere, if there be an atmosphere.

That the light, heat and electricity of earth, as we know them to be, do not come as such directly to earth from the sun and fixed stars, we know, for there is a definite progressive lowering of temperature, the farther away from the surface of the earth where the temperature is measured. This progressive lowering ends at the outermost edge of the atmosphere, in the absolute zero,—273° C. of all interstellar space. From this, we know that there is a transformation of the oscillation of the spheres composing the ether, when the oscillation coming through space enter the earth's atmosphere where they are changed into the forms of energy, which we know as heat and light. This is conclusively proven by the known fact, that meteorites, composed of iron and nickel principally, when they strike the earth's atmosphere, are at the temperature of the absolute zero of space.

A further factor of proof is that light and heat arrive on earth simultaneously from space, while electricity is the product of the transformation of some one or more forms of energy; magnetism being its principal source on this earth.

Rigel shows the excessive presence of helium at the high temperature of over 12,000° C., and apparently from this showing, helium is the principal component of Rigel. This would be plausible, were it not for the fact that gases of varying composition always mix when in contact. From this law, we know that owing to the known high temperature of Rigel, the outer envelope only of Rigel is helium, but that its interior is composed of the same elements as other suns, and that eventually they will mix into normal components of a sun's elements as cooling progresses.

The stars of the Orion star cluster, of which Rigel is one star, are in that stage of development where remnants of its primary nebular state are still in evidence, with Rigel still twice as hot as our sun, with a temperature of over twelve thousand degrees centigrade. At this temperature all chemical combination of the elemental atoms is set at naught. At this high temperature, all the elemental atoms are separate and distinct entities, being dissociated, but they are not annihilated! They are simply not in any combination with others, being wholly free and distinct in the forming sun Rigel. Why are they under this high temperature? That the Orion star cluster was a nebula of star debris is certain, for we can still see portions of it in its nebular component condition, but its debris is very far lower in temperature than the one condensation of Rigel. That gravity is the cause of the clusters forming is certain; but does gravity as a pulling force squeeze the energy out of the condensing matter? I think not! Gravity is not a force which pulls. Gravity is a "vis a tergo." It is not a "vis a frontis."

When a great sun, with its own attendant satellites, is reduced to star debris when colliding with a dark star field, its component atoms and its energy, are in due course pushed together again to form another solar system by gravity. In the Rigel Stage, as an instance, the gravity, pushing the debris together, squeezes the energy out as caloric energy. But, and this is vital, the energy is not lost. It is sent into, and stored in the interstellar ether, or in the debris contained within the ether. When we consider that our nearest neighbor in space is over four light years away, and that there is interstellar ether and star debris all the way between, there is matter enough and to spare, to store the sum of energy not required for the existence of a solar system. That there is a varying degree of force exerted in certain given straight lines by gravity in space is certain, for the push is varied by the presence of star aggregation. The push of gravity exerted through the ether is due to the presence of aggregations of ponderable matter in the ether. These aggregations may be the gaseous components of comets, or masses of metals, from the trifling meteorite to giant suns. All alike are composed of the elemental atomic matter of space, and are capable of entering into chemical combinations as chemical molecules, which the elemental ether is not. Nowhere in space are the aggregations of ponderable matter present in equally sized aggregations. Nor are they ever in aggregations of equal density. In these two factors lies the reason of why gravity is put out of equilibrium by the aggregations of matter in space in a varying degree. And because of this; perpetual motion is the law of the universe. This can be formulated in definite laws. The trick is, to get them with the wording accuratuely complying with fact. Gravity is put out of equilibrium in direct proportion to the density and volume of the mass of ponderable matter present in the ether, and which displaces its own volume of the ether. It is the displacing of the ether present in the atmosphere in varying degree by the given aggregation of matter due to its density, which we recognize as specific gravity. Our atmosphere is a part of the earth's mass, and the ether from the interstellar space presses upon it from without, and is also mixed in with it, and thereby gravity acts. Then the density of the solid earth's mass, determines a lesser pressure from the ether coming through it from space, in opposition to that coming only through the atmosphere from the opposite side. Because of this, if we could have a void or a perfect vacum, at the center of the earth, large enough to place any kind of a mass of matter, it would stay put; for at the earth's center gravity is in equilibrium, and this in spite of the fact that the earth is not a perfect sphere, but it is a solid, which is the determining factor. The size and density of the mass is what determines the difference in weight on the different asteroids, the planets and the sun, which determines a varying push. Comets do not, because of their gaseous condition, have a dead center of equilibrium. These instances show how gravity acts locally on a solid mass of ponderable matter in space, and on a gaseous body. But where the other is displaced by a solar system, gravity is put out of equilibrium directly in proportion to the mass and the density of the units of the solar system. Were the units of any one solar system of equal size and density, that system would be in equilibrium as to its units, local solar system motion would cease, and it would then be pushed about in space as a unit of its own nebular universe only. The known whirling of nebular universes is due to the ethers being displaced in straight lines between the units composing the nebular universe, and the push acting from the outside upon the entire mass as a whole, is what causes the revolving motion.

The apple which falls to the ground from a tree does not fall because it is pulled to the ground, but because there is the solid ground below it, and the ponderable matter of infinite space above it which pushes it towards the firm ground, the gravity push from above being opposed by the push through the solid ground below, toward which gravity, pushing from infinite space above, pushes the apple, but acts more forcibly through the air above because of its greater power due to greater mass. Gravity's push is of varying force on the earth, because the earth is not a perfect sphere. Were it a perfect sphere, instead of being bulged at the equator, gravity's push would be alike over the entire surface of the earth. The apple which falls to earth from a tree does not fall because it is pulled to earth, but because it is pushed to earth by the push of gravity. Gravity is a force pushing from all directions in equilibrium through the ether. When the apple is loosened from the tree, the gravity equilibrium is destroyed, and gravity's push coming from space through the atmosphere, is greater than the opposing push coming from earth. And being greater, the apple falls. Gravity's push is of varying force on earth, because the earth is not a perfect sphere. Were it a perfect sphere, instead of being bulged at the equator, gravity's push would be alike over the entire surface of the earth, not greatest at the poles as it is now. This bulging at the equator, with its greater diameter, has such effect on gravity that gravity's equilibrium is upset in a greater degree through the equator than through the poles. Gravity being a push from all directions in equilibrium, it is exerted around the earth as well as through it. And gravity being exerted throughout space, the bulging of the earth at the equator is what puts gravity's equilibrium out of equilibrium during its rotation in regular sequence and back again; and this is what forces the earth into an eclipse with its attendant changes in velocity in its orbit aound the sun, and produces the tilting of the earth, and so produces the seasons. Were the earth a perfect sphere, the earth's orbit would be a circle, as Copernicus thought it to be. Gravity, being put out of equilibrium in space, by the presence of aggregations of matter of varying sizes and density, as suns, planets, etc., proportional to volume and density is what pushes them about in space. It is this being put out of equilibrium of gravity which produces the changes, which result in the formation of solar systems and their destruction in regular sequence. We know that our solar system is going through space at the rate of eleven miles per second towards Vega. We also know that each and every star in our nebular universe is in motion; and we know that our universe itself is rotating at a speed of over one thousand miles per second for the speed at the periphery. We also know that equilibrium of gravity must be a constant matter, but that it is put out of equilibrium when a fixed star crashes into a dark star field, and so forming a nova. And this is what is one stage of that revolution the stars undergo in the course of time, from solar system back to solar system, with its product of eternity.

That gravity is a push and not a pull is further shown by the star debris of our solar system revolving around the sun, wholly independent of the supposed earth's gravity pull, in fixed debris aggregations. Meteors, which are star debris, striking the earth only when the earth passes across the debris' orbit.

It is the fact of the meteors striking the earth at all which demonstrates gravity to be a push exerted by or through the ether of space upon the mass of matter of the meteor. Were gravity a pull, the meteroic mass would not strike the earth at all, but coming within the limit of the earth's pull and in balance between the opposing pushes of gravity it would take on an eliptical course revolving around the earth. Just as the earth revolves in its course around the sun and there would be held, while revolving in equilibrium by gravity in its orbit. When through the velocity attained by a mass of rock or metal, which is ejected from a volcano, the velocity being greater than the gravity push, to push it back to earth, the ejected mass does not revolve around the earth, but it is pushed in an eliptical path around the central mass of our solar system, the sun. And being a mass which is an integral component of our solar system, it is in its turn pushed about in space as an integral part of it. If gravity were a pull, instead of a push, in equilibrium exerted through the ether in opposition from all directions, the pull would be accumulating a belt around the earth of star debris. It is the velocity of the meteor itself which is what overcomes the opposing push of gravity, and so gets to earth. If a cannon ball were fired from earth with a velocity so great as to carry it beyond the gravity push pressing upon the earth, it would not take on a course around the earth, but it would revolve around the central sun. It is the twenty million meteors, which are estimated to fall upon the earth daily, that will in time bring about the destruction of the earth, and the moon, with gravity as the destroying force. The space occpied by our solar system is literally crowded with star debris, as is so clearly shown by the zodiacal light, which is simply light reflected from myriads of meteorites, revolving around the sun in a definite orbit. Gravity is a force which governs the motions of ponderable bodies as matter, as it exists in infinite space, being exerted through the medium of the intersteller ether, pervading all space; which ether is composed of ultimate atoms of ponderable geometrical magnitudes having definite dimensions. Gravity governs the motion of a trifling meteorite, just as fully as the motions of a vast nebular universe, requiring hundreds of thousands of light years for light to cross it. While none are placed in equilibrium anywhere in space; and because of this, they are eternally pushed about in space, but in perfect order just as gravity determines. That no aggregations of matter, which go to make up solar systems, aerolites, comets, planets, suns, or any other aggregation, are ever of the same size or density, is the definite reason why none of them exist in space at rest in equilibrium. It is this varying size and density of the matter aggregations, in space, which determine that they are forever being pushed about in space.

Were gravity a pull, that is, a "vis a frontis," the earth's mass as a whole would revolve around the sun, without the tilting which produces the seasons. And further, it would revolve with equal velocity, in all parts in its entire orbital revolution, around the sun. But the earth does not so revolve. The earth's orbit being an elipse, it revolves with varying speed in its orbit. The different motions of the earth are too many, for gravity as a pull, to explain them all. First, we have the daily revolution on its axis, then we have the revolution of the earth and the moon around a common center, situated about 400 miles within the earth's surface. Next the revolution around the sun, with its attendant tilting. Here we have four definitely known motions, which are easy of proof. These motions are accompanied by a staggering of the earth in its daily revolution, which is a motion that causes the north pole to constantly change its position by a few rods, or even miles. The sixth motion is a motion which causes the north pole to travel in a circle that takes several thousand years for its completion. These motions are only those which are a part of the earth's revolution around the sun. But there are several more. Our entire solar system is traveling towards the fixed star Vega, as is proven by the spectroscope, and at a velocity of something like twelve miles per second. This is an internebular motion quite distinct from the spinning of our nebular universe around its own center, which center is calculated to be somewhere near the Orion cluster. This spinning is with the enormous velocity of over 1,000 miles per second at its periphery, and requiring over 400,000 years for one revolution. Here are no less than eight separate and distinct motions which our mother earth has a share in. While a probable ninth is one where nebular universes, as separate entities, revolve in definite paths, as such, around each other. Gravity, as a pull, does not, in a satisfactory way, explain any of these known notions. But gravity, as a "vis a tergo," comes nearer an explanation. We know that no two stars or planets are of exactly the same size or density. And we know that this variance extends throughout all aggregations of matter in space. It is this known difference in size and density that constantly upsets the equilibrium of gravity's opposing push, which is everywhere and always exerted in space. As an example, we know that the density of the earth is somewhere between that of lead and iron. And we know that some of the fixed stars are lighter than water.

What more reasonable than to assume that gravity's equilibrium is put out of balance in direct proportion to the density and proximity or nearness of the mass, as regards the intensity of the counter push between the nearer masses, and put out of equilibrium in a lesser degree by the lesser density but greater mass and distance. The degree of disturbance of equilibrium is exerted in distance in direct proportion to the size of the mass. Accepting these two explanations, we can readily see that in the last one lies the fact that no two planets are of the same diameter; the meteors in space constantly striking the planets; their mass is constantly being increased in a regular manner, and the increase being proportional to the size of the mass. And this increase will, in course of passing time, change their relative distance relations to the central sun. And this in turn will in time upset the equilibrium now existing between the solar systems, and send it into a dark star field and bring about its destruction. Time, in eternity, is a wholly neglible factor. Accepting as fact that gravity is a push exerted by the ether in space, in opposition always, there is always a point of balance somewhere, in every case where the equilibrium, has been or is being upset. It is this point of balance, which was reached by the condensation of the original solar system nebula as planetary units, that put the solar system's planets, comets, and asteroids into their present orbits. The condensations did not, however, gather all of the debris of the nebula into these condensations, but leaving the meteoric belts to go it alone, in their orbits around the sun.

This is apparently borne out by the known fact, that several of Jupiter's nine moons go around the planet in opposite directions from the other of Jupiter's moons. These, in opposite direction moving moons, were little planetary masses, which in their orbit around the sun, came to a point where gravity put them in balance with Jupiter, and forced them into their present orbit around Jupiter. Had the velocity of these little masses been so great that no balance could have been established, they would simply have continued in their original orbit around the sun. This same law was operative, when the only one of the asteroids known to have a moon, had its tiny 10-mile in diameter satellite come into gravity balance, and was there and then forced into its present orbit as an asteroid's moon.

The velocity, with which meteors are pushed about in space by gravity, is such that those which are reached by the earth in its revolution about the central sun, go too fast for an equilibrium to be established between the push coming from space, and the opposing push coming in opposition in line from the earth, for them to get into a belt or band around the earth.

The velocity, with which the meteors strike the earth's atmosphere, is anywhere from forty miles per second when they strike the earth head on, to six miles per second when they overtake the earth. The lower of these velocities, is still too great for a balance to be established to form a belt, to travel in an orbit around the earth, and the result is that the meteors strike the earth. There evidently is a law, that the equilibrium of gravity is put out of balance in direct proportion to the density of the aggregation of matter as a coherent mass. And this law was in operation when Saturn, during its revolution in its orbit, brought about an equilibrium of the local opposing push, when it encountered a swarm of small meteors of approximately the same size, and they became fixed as Saturn's rings of tiny moonlets. It is this law, which causes the rifts to appear in Saturn's rings, when the outer larger moons are in line with Saturn.

This law was operative also, when the one asteroid which has a moon satellite, encountered its moonlet; and it was put into balance in its orbit around the asteroid, where it will remain until our solar system is disintegrated eons of time hence. This opposing push of gravity, was brought into equilibrium when Jupiter captured its moons, which travel in opposite directions from the others; the captured moons keeping on going in the direction they were going when captured.

It is this varying push of gravity, which in the course of time, results in the star debris being pushed into the condensations which compose solar systems. The difference in the force of the gravity push, on this earth, varies with the difference in distance from the earth's centre, while in the interstellar space it is interferred with and forced out of equilibrium, by the presence of aggregations of matter as suns, planets, comets, etc. Gravity is a force like electricity, where there is always an oscillation in opposite directions; gravity acting in straight lines in opposition, and electricity in a circle. Gravity is a force always in action, pushing in opposite directions in equilibrium from all directions. Its actions becoming manifest when it is put out of equilibrium, by the presence in space of some aggregation of more or less solid matter in space. Now this being out of equilibrium is occurring all of the time, by the aggregations of matter in space, and this is what, in the course of passing time, brings destruction to solar systems and then in regular sequence, their reconstruction. From nebula back to nebula, or from solar system back to solar system, the passing of time is wholly negligble in eternity. Nebular systems as such are eternal. Their component atoms and energy are what undergoes the changes of the universe, which constitute the phenomena of nature. This brings us back to the basic fact, that all natural laws are in perfect harmony, and that nothing is due to chance. Nature is an open book, open to all who can, or will, read it. There is no mystery, or anything hidden or concealed about it, for revelations to explain.

In the matter of the known valency of the elements, we have the known periodic law as a basic fact. This basic fact is due to a definite cause. What more reasonable than to assume, that the atoms being definite geometrical magnitudes, that is physical solids, their valency is due to the reason that with other atoms, they form molecules in direct proportion or in consequence of, the definite number of the bounding facets of the several atoms for other atoms to combine with or to join onto these definite bounding facets. In the apparent transmutation of Radium to Helium, we can reasonably assume, that the Radium atom is a coiled up flattened spring, forced into the form of a coiled up flattened spring by nature's forces under fixed conditions; which spring, being formed with the expenditure of a fixed amount of energy, the spring yields up its energy, when under definite conditions the spring is uncoiled to form a helix. The atom we know as radium, being the flattened coiled up spring; and the atom we know as Helium, being the uncoiled spring as a helix. The intense heat, due to the compression of gravity on Rigel, uncoiling the radium atom to Helium. Eventually Helium goes back to Radium under definite conditions. The Radium atom, apparently, sets aside the atomic theory that an atom is an indivisible entity, incapable of further subdivision. For it is proved that Radium becomes Helium under certain conditions. But my explanation, apparently, confirms the atomic theory. The Helium atom is in the first group in the periodic, or as it is more recently given as the zero group by Baskerville, with an atomic weight of 3.99. Specific gravity of 0.1368, compared with air for its gas, with no inorganic or any other molecules known as chemical compounds containing Helium, its helical atomic form precludes all molecular combinations from forming. I am also of the opinion, that it forms only the outer gaseous envelope of the giant sun Rigel. Radium, the coiled up flattened spring, has its two surfaces, its upper and lower faces for other atoms to chemically join; and we have as chemical molecules, a radium bromide $RaBr_2$ and $RaCl_2$ as radium chloride; Radium having the extremely high atomic weight of 226.4 due to its compact atomic form as radium. There is the apparent objection that this explanation cannot be correct, for we should assume that all atoms are rigid entities. But rubber, a well known substance, has elasticity. So why can't the coiled up spring radium, also have elasticity, requiring energy for its coiling and liberating energy when uncoiled? This explanation looks good to me. We can further reasonably assume, that the coiled up spring, is either a flattened wire or a rod having semi-circular or hemispherical extremities. In either case, there are but two facets for other atoms to join onto chemically, as the radium atom. By assuming we have chemical union of the atoms as molecules, we are on fairly solid ground;

for we know that in a chemical molecule there are but the component atoms of the given molecule, and the atoms, under the theory that their bounding facets are what determines their valency, we have only to assume that the chemical union is the joining of the different atom's facets, so that they are tangent with nothing between; and the atoms combining in direct proportion with the number of facets of the several atoms.

As an illustration of why there is a valency to the atoms, when combining into molecules, based upon a definite number of facets of the several atoms, we can take the lingnin or wood, the dextrin, and the starch molecules, which are of the same ultimate chemical atomic composition. They are $C_6H_{10}O_5$. Carbon six, Hydrogen ten, Oxygen five. But what vastly different properties these have is almost too well known to be mentioned. Yet incidentally it is trite. All of these molecules are given in the text-books varyingly as $C_6H_{10}O_5$ or $C_{12}H_{20}O_{10}$ or $C_{18}H_{30}O_{15}$. Explaining the various properties of these several bodies as based on my atomic theory of the atoms as physical solids having their valency determined by their ultimate geometrical forms, we can assume logically, that the lignin, the dextrin, and the starch molecules are all compound molecules. A composition as follows, for the lignin molecule, $C_6 + 6(H_2O) + C_6 + 4(H_2O)$ giving an even number of carbon atoms for each of the primary molecules. Assuming that the lignin molecule is a compound molecule, composed of two primary molecules, and it having a different water content for the separate composing molecules, the same amount of carbon in each primary molecule can be considered as determining so firm a chemical union, that lignin or wood, is non-fermentable, and that the gastric juices of the human stomach are unable to split up the lignin molecule, and that in consequence of this they are useless as food for man. But all ruminating animals can digest, and assimilate lignin as food. The second chewing of the lignin, after it had been swallowed, so much further bringing the chemical changes indispensably required for the changes to result in assimilable substances.

Dextrin, the intermediate molecular combination of these three molecules, can be explained as being $C_8 + 5\,(H_2O) + C_4 + 5(H_2O)$. These Carbon atoms being unlike for the primaries, with the water molecules the same for both of the primaries. This molecular arrangement can be considered as being the reason why the dextrin molecule is not capable of undergoing fermentation. And also of doubtful value as food.

The starch molecule can be considered as being of ultimate unequal molecular composition, for both of its component molecules. The arrangement of the atoms forming the molecules can be considered as follows: $C_3 + .4(H_2O) + C_9 + 6(H_2O)$. It can be assumed that because of this unequal atomic, and molecular arrangement that the starch molecule is both fermentable, and digestible.

This illustration of these different arrangements of the atoms into primary molecules, and then into compound molecules, is not at variance with known methods, whereby synthetic chemicals are produced constantly in all laboratories.

If we assume that carbon, which is quadrivalent in the periodic system, is a cube or a modification of the cube for its atoms, we need only to assume that it admits of the other atoms composing these three substances to variously become tangent, in an arrangement for the ultimate atoms, to form the compounds as we know them.

There is apparently a discrepancy here, in that Carbon should be hexadic in the periodic system, but in the above given formulas, there is a six atom carbon molecule, which indicates six facets for other atoms to be joined on to. Then the specific gravity of none of the three substances is alike, which indicates that there is not a complete covering of the area of the facet by the other atoms joining on, when forming molecules.

The crystalline form of the diamond, which as a gem diamond, is nine hundred and ninety-nine, plus; pure carbon per thousand, does show, however, an octohedron, or a cube, or some modification of those geometrical figures, which are of a form which admits of chemical molecules forming, so that carbon is quadrivalent.

It is this actual crystalline form of almost absolutely pure carbon which distinctly points out the fact, that the diamond is a built up aggregation of atoms, showing the enlarged physical solid carbon atoms, and retaining the form of the atom in the enlarged crystalline form.

That all atoms have facets, we can logically assume from the fact that the chemistry of carbon, is the entire field of organic chemistry, where all of the elemental atoms are included, except those incapable of forming chemical molecules.

Under the conditions of temperature and gravity pressure, which obtain on earth, the first or zero class, in the newer and revised periodic system, is incapable of chemical union as we know it, and this is due to the basic and governing primary form of their atoms. In the periodic system there are known gaps of atomic forms in the elemental groups of this system, while some of the gaps may even be voids. Some of these atoms of the known gaps are present in the spectra of the sun and other fixed stars; for instance, Coronium in the sun's chromosphere. It is the ultimate form of the elemental atoms without question, which is the basic reason of why there is the form of energy exerted, which we know as electricity. Reason shows, that there must be ponderable matter in oscillation to produce it at all; and we know that there are two electrical flows in opposite directions always, to make a closed circle.

The above being basic, it is to be determined what is the ultimate form of the elemental atom, which can and does, produce the oscillation of matter known as electricity. None of the eight elemental geometric magnitudes, which with their modifications, are the form of the ultimate ponderable atomic matter of infinite space, except the very first one, the sphere, will permit a wave oscillation which can produce the phenomenon of electricity.

The sphere permits of wave oscillations, which will account for electric energy. Geometry shows that any cubic space, or simply space, can be completely filled by spheres of equal dimensions, except its voids. It also shows that each and every sphere in space, can be a central one around which twelve others are grouped, tangent; six in a circle around the central one, and six more in the spaces between the tangent surrounding six with three on each side. Anybody can prove this by simply using the ball bearings of an auto or a bicycle, and arranging them in a circle, having one, the seventh, in the centre, and placing three on top. Upon examining this arrangement of the spheres, it will be seen that the three on the circle can be arranged in two ways or positions, for there are six interspaces. But only three will lie on the circle composed of seven. Now in this fact, that but three will lie on the circle of six with its central one, the seventh, but with six interspaces, we can assume, that the electric energy is so transmitted through the central seventh being tangent to both the three upper and the three lower spheres of the thirteen composing the group, the two groups of three on opposite sides of the central sphere, are oscillated out of their normal position, in the interspaces of six and back again, into their former normal position, by the return flow of the electric current. With this reasonable explanation, we have a molecular theory of electricity which looks good. We can further assume, that the ultimate ether spheres are of so extremely minute a character that they actually fill all interstellar and intermolecular space, and being confined, must so oscillate that electric energy is the result of a given oscillation impulse. We can further reasonably assume, that energy coming through interstellar space, the oscillations come directly through the central seventh and the three tangent on each side, without any such shifting of the six opposing spheres, as when the electrical energy is flowing, the oscillation waves coming as light and heat waves, or so as to produce them on earth. Energy, coming to earth in this way, is then further transformed when it enters the earth's atmosphere, into the earth's heat and light energy. All of the other forms of energy as we know them, are transformations of the primary form, being due to the way the energy is produced by the varying manner in which the wave oscillations of the ultimate ether spheres can be, or are, produced or started. Here we have a reasonable and logical explanation of energy, which in no way apparently shows, that theory and known fact are in opposition. In the above we have definite known basic facts, proving that the ponderable matter of space can be geometric magnitudes of definite form. And we know that energy is present as a fixed definite entity, along with all other matter in space, it being further proven and known that energy is just as positive an entity as matter itself; all of which proves that there is a creative power in disintegration in the universe; that evolution is but an arc in the circle of eternal revolution in the universe. Here we can say finis! Or requiescat in pace! In the formulating of the above chemico-physical laws, which apparently furnish a link in known natural laws, the factor of time which must elapse and what must have been established before, so that a natural law can be set forth and definitely formulated at all, is clearly shown by the many years which have passed, since man first made a record of his studies of the starry heavens, until now. It also shows what a very small part the individual student plays, or can play, in recording the vast sum of human knowledge. And it is axiomatic, that there is a regular sequence in the human record. Another factor is, that the earliest recorded beginning was over seven thousand years B. C. when the Chaldeans first mapped out the constellations. When Alexander the Great entered Babylon about 330 B. C., he there found records of astronomical observations dating back nineteen hundred years, a period of time as long as the Christian era. Nothing further, however, than records of the seasons, eclipses, comets, etc., along with their well defined constellations. The next people, of whom we have record, are the Egyptians who established the cardinal points of the compass, the length of the year, and that there was an eleven-year cycle variation in temperature. In all the records of these centuries, not a single name of note appears, until Cladius Ptolemy A. D. 130, which marks an epoch making disclosure. There simply was nothing known of the natural laws governing the universe, so that no individual student could make a positive announcement of a discovery, or even propound a theory based on known fact, before Ptolemy's time. The Catalogue of the stars by Ptolemy, giving their names, positions, and descriptions if any, marks the time when individual students were able to set up theories, and make definite assertion, based on known fact. Progress has been painfully slow. For almost fifteen hundred years Ptolemy's conclusion that the earth was stationary, with the stars fixed in a crystalline globe surrounding the earth, was generally accepted. And his star lists are the basis of all star atlasses, to this day. His own observations, with almost nothing to work with, proved correct. The next conspicuous name of record, is that of Copernicus (1473-1543), who first explained the seasons, and that the sun was the center of the solar system; but not until 1610 was it proven by Galileo. The long period from 130 to 1543 A. D. was required for the science of mathematics to be developed to such an extent that Copernicus was able to make the necessary calculations proving the seasons. We, in our day, cannot grasp under what disadvantages those early men labored. Mathematics, the science of numbers, as we know it, was not known until the eleventh century when the first beginnings were made. And not until Napier (1550-1617) invented logarithms, were astronomers able to make an astronomical calculation, and be sure that they were right. Copernicus still used long figures in his calculations. The next epoch making figure, is the Dane, Tycho Brahe (1546-1601). Not that he set forth any great law, but with the most complete apparatus of his time, made a long series of observations of where the planets were, on given dates; from which results John Kepler, (1571-1630), the successor of Brahe, was able to work out the laws governing planetary motion. Kepler had Napier's logarithms to work with. Galileo (1564-1642) was the contemporary of Kepler. But whether they ever communicated, is not known. Galileo's invention of the first telescope, proved that the sun was the centre of the solar system, and not the earth. Disproving Ptolemy. It was not until 1851 that Foucault, hanging a great pendulum in the Pantheon in Paris, proved by its disturbed vibrations, that the earth revolved on its axis. Hughens (1629-1695) perfected the telescope, by making perfect compound lenses, which show that some of the nearer fixed stars, move about in a small circle, while the earth revolves around the central sun; proving that the earth does revolve around the sun. The next great epoch making figure is Sir Isaac Newton (1642-1727). By his formulating the laws of gravity, he proved Kepler right in formulating his laws of planetary motion. Gravity proves Kepler right. But in my judgment, gravity is the result of a "vis a tergo," not "vis a frontis." Romer (1644-1710), the contemporary of Newton, by his attempting to compute the orbits of Jupiter's moons, discovered the velocity of light.

The next factor was the invention of the spectroscope, by Kirchhoff and Bunsen in 1860, by means of which, qualitative analysis can be made of the light rays coming from the fixed stars; and these accurately give the elements composing the fixed stars. They prove that the elements composing our solar system, are those which compose them, proving that the ultimate elements of infinite space are alike throughout.

It was not until 1863, that Clark discovered the first satellite, or rather the double star of Sirius, the second nearest fixed star to our solar system.

In the above names are comprised the principal ones which have brought the positive facts of astronomy, as we now know it, to its present state. The next factor was to prove that there is a creative power in disintegration in the universe. I feel sure that I have formulated the final laws which prove, or have proven, that in the three laws as given above by myself, the gap is closed in the circle of revolutions through eternity.

DR. FREDERICK C. WEBER.

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